REMARKS

The Examiner is thanked for the performance of a thorough search.

Prior to this response, Claims 1-48 were pending in the application. In this response, no claims are added or canceled. Hence, Claims 1-48 are pending in the application upon entry of this response.

Claims 1, 9, 10, 38, 39, 42, 47, and 48 are amended herein.

SUMMARY OF THE REJECTIONS/OBJECTIONS

Claims 9 and 10 were rejected under 35 U.S.C. §112, second paragraph; and

Claims 1-48 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Aboulnaga et al. ("*Aboulnaga*"; "Building XML Statistics for the Hidden Web") in view of Chaudhuri et al. ("*Chaudhuri*"; U.S. Pat. Publication No. 2004/0236762).

Claims 38 and 39 were objected to because of informalities.

THE OBJECTIONS

Claims 38 and 39 were objected to because of informalities, namely typographical errors.

Claim 38 is amended to replace "statistics about XML resource" with "statistics about XML resources".

Claim 39 is amended to replace "as XML data type" with "as an XML data type". Claim 39 is not intended to recite multiple XML data types for storing the statistics, rather, various statistics are stored according to an XML data type.

Based on the foregoing, the objections to the claims are overcome and are now moot.

THE REJECTIONS NOT BASED ON THE PRIOR ART

Claims 9 and 10 were rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite. Specifically, these claims were rejected because of insufficient antecedent bases.

Claims 9 and 10 are each amended to replace "said operator" with "an operator contained in at least one of said one or more predicates" where the "one or more predicates" are introduced in Claim 8, from which Claims 9 and 10 depend. Hence, sufficient antecedent basis is now present. Reconsideration and withdrawal of the rejection of Claims 9 and 10 under 35 U.S.C. §112, second paragraph, is requested.

THE REJECTIONS BASED ON THE PRIOR ART

Claims 1-48 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over *Aboulnaga* in view of *Chaudhuri*.

Claim 1 is amended to further define the statistics that are gathered for the XML resources, by reciting:

> gathering statistics about XML resources based on said XML resources
> that are stored in a database repository, wherein said statistics characterize a
> structure of nodes, within a hierarchical structure in which said XML resources
> are logically organized, under each of one or more particular paths in said
> hierarchical structure.

The Office Action relied on *Aboulnaga* for a teaching of gathering statistics about XML resources stored in a database repository. Applicants acknowledge that *Aboulnaga* discloses statistics about XML resources. However, *Aboulnaga* does not teach or reasonably suggest gathering **statistics that characterize the structure of the nodes under each of one or more particular paths in a hierarchical structure** in which the XML resources are organized.

By contrast, *Aboulnaga* tries to estimate the number of nodes t_n that are reached by a particular navigation path of the general form, $//a_1/a_2/.../a_n$, i.e., the number of nodes that are traversed when navigating the particular navigation path. Such a query path finds element nodes with tag name t_1 (at level a_1) anywhere in the XML tree representing a document, possibly filters these nodes based on a corresponding condition c_1, and from the remaining nodes, navigates down to all t_2 children (at level a_2), then down to all t_3 children (at level a_3), and so on until t_n element nodes are reached (at level a_n). Significantly, this estimation of the number of nodes reached by the navigation path clearly **does not extend to any of the nodes under the terminal element node t_n corresponding to the path $//a_1/a_2/.../a_n$** (section 3.1, last paragraph). Therefore, *Aboulnaga* does not teach or suggest the subject matter recited in amended Claim 1 because it does not disclose characterizing the structure of the nodes *under* each of one or more particular paths.

Additionally, *Chaudhuri* does not cure the foregoing deficiencies in the teachings of *Aboulnaga*, especially in that *Chaudhuri* also fails to teach or reasonably suggest gathering statistics that characterize the structure of the nodes that are under each of one or more particular paths in a hierarchical structure.

In fact, *Aboulnaga* is unable to know anything about the structure of the XML data below the query path because they **cannot scan the entire data to build statistics**. Rather, the statistics of *Aboulnaga* are **constructed solely by observing user queries** (e.g., a query containing the path $//a_1/a_2/.../a_n$) to hidden Web data sources and their results. *Aboulnaga* discloses the use of past queries to a data source to estimate the selectivity of different future queries to this data source (section 1.2, paragraphs 2-4). However, this is fundamentally different from **gathering statistics about XML resources based on the resources themselves**, such as by or from a database system in which the XML resources are stored.

Furthermore, *Aboulnaga* "teaches away" from the embodiment recited in Claim 1 because *Aboulnaga* explicitly states that "we can only use the *sizes* of the query results (i.e., the number of XML elements they contain) for constructing the on-line XML statistics" (section 1.2, paragraph 4) and "we cannot even view this data set, being able only to observe it indirectly" (section 1.2, paragraph 5). *Aboulnaga* proceeds to state the "[i]n such a situation, it is unrealistic to expect solutions of the same quality as those that have been developed for the highly constrained environment of query optimization for relational data or static XML data" and, in fact, admits that "is not our goal" (section 1.2, paragraph 5). Hence, the foregoing statements explicitly **teaches away** from the subject matter recited in Claim 1, in which the **statistics about XML resources are gathered based on said XML resources that are stored in a database repository**, i.e., based on the resources themselves.

Based on the foregoing, one of ordinary skill in the art would not be motivated or able to combine the *Aboulnaga* reference with the *Chaudhuri* reference in a manner to derive the subject matter recited in Claim 1. This is because not only do the combined teachings of the cited references not teach the entire subject matter of Claim 1, but the primary reference, *Aboulnaga*, explicitly teaches away from its use in deriving the subject matter of Claim 1.

Independent **Claims 38, 42, 47, and 48** are amended similarly to Claim 1, by further defining the nature of the statistics about the XML resources, namely that the statistics characterize the structure of nodes under each of one or more particular paths in a hierarchical structure. **Claims 2-37** depend from Claim 1; **Claims 39-41** depend from Claim 38; **Claims 43-46** depend from Claim 42. Therefore, each of these dependent claims is patentable over the cited references of record for at least the same reasons as the independent claim from which it depends. Furthermore, each of these dependent claims includes at least one other limitation that makes it further patentable over the references of record. However, due to the fundamental

difference between Claim 1 and *Aboulnaga* and *Chaudhuri* discussed above, discussion of these additional differences is unnecessary and is foregone at this time beyond the extent that may be presented hereafter. However, the rejection of the dependent claims is collectively traversed, and no statements of official notice, overarching allegations of obviousness, or allegations of well-known features that may be present in the Office Action are stipulated to or admitted as prior art features, and the right to separately argue such features in the future is not disclaimed. Reconsideration and withdrawal of the rejection of Claims 1-48 under 35 U.S.C. § 103(a) is respectfully requested.

For example, the Office Action relied on paragraph [0028] of *Chaudhuri* for an alleged teaching of the subject matter of **Claims 2 and 3**, which **recite specific statistics that are or may be gathered about the XML resources**. However, *Chaudhuri* does not even mention XML data and, therefore, could not and does not disclose XML resources that are logically organized in a hierarchy of nodes or statistics about the number of nodes and/or containers that are accessible via a path through a given node. Furthermore, the cited paragraph of *Chaudhuri* does not even have an implicit or inherent relationship to the subject matter of Claims 2 and 3, i.e., the citation has nothing to do with the recited subject matter. Thus, Claims 2 and 3 are further patentable over the cited references of record for these additional reasons.

For another example, the Office Action again relied on paragraph [0028] of *Chaudhuri* for an alleged teaching of the subject matter of **Claim 4**, which recites that **the statistics are stored in a relational table in the same database of which the XML repository is part**. Granted, the citation of *Chaudhuri* mentions statistics on intermediate tables (SITs) based on attributes of tables, but does not disclose storing the statistics in any table and certainly not in a database in which corresponding XML resources are stored. Thus, Claim 4 is further patentable over the cited references of record for these additional reasons.

For another example, the Office Action relied on the paragraph [0034] of *Chaudhuri* for an alleged teaching of the subject matter of **Claim 11**, which recites that **the computational cost associated with various methods of accessing XML resources includes the cost of traversing an index** to locate a particular XML resource. However, this citation does not mention anything about including index traversal in the computational cost. **Claims 12 and 13** recite more specific computational costs associated with the cost of traversing an index, the CPU cost and the I/O costs (i.e., "reading data blocks"), respectively. The Office Action relies on paragraphs [0030] and [0034], and [0034] and [0035], for alleged teachings of CPU cost and I/O cost, respectively. However, these citations simply do not mention anything about including CPU costs and I/O costs in the cost of index traversal in the computational cost of methods of accessing XML resources stored in a data repository. Thus, Claims 11-13 are further patentable over the cited references of record for these additional reasons.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Please charge any shortages or credit any overages to Deposit Account No. 50-302.

Respectfully submitted,

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